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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/841,442	04/24/2001	Kevin Albert Maher	5659-05900/EBM	4754

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ERIC B. MEYERTONS
MEYERTONS, HOOD, KIVLIN, KOWET, & GOETZEL, P.C.
P.O. BOX 398
AUSTIN, TX 78767-0398

EXAMINER

KRECK, JOHN J

ART UNIT	PAPER NUMBER
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3673

DATE MAILED: 05/05/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/841,442

Applicant(s)

MAHER ET AL.

Examiner

John Kreck

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 13 March 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2039-2042, 2044-2081, 2083-2116 and 5150-5155 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2039-2042, 2044-2081, 2083-2116 and 5150-5155 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 23,26
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 3/13/03 has been entered.
2. Claims 2039-2042, 2044-2081, 2083-2116, and 5150-5155 are pending.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 2039; 2041, 2042, 2044, 2049-2053, 2057-2064, 2066, 2067, 2072, 2073, 2074, 2078, 2080, 2081, 2083, 2088-2092, 2096-2103, 2105, 2106, 2111-2113, 5150, 5152, 5153 rejected under 35 U.S.C. 103(a) as being unpatentable over Puri (U.S. Patent number 4,537,252) in view of Terry (U.S. Patent number 3,924,680) and "Coalbed Methane: Principles and Practice".

Puri teaches a method of treating a coal formation comprising the steps of providing heat from one or more heaters located in heater wells (see col. 6, lines 34-44); allowing the heat to transfer; and producing a mixture from the formation. Puri fails to

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teach the formation has been selected using a moisture content, wherein the moisture content is less than 15%.

Terry teaches that moisture is a nuisance in such processes (col. 1, line 28, and col. 2, line 7); and "Coalbed Methane" teaches that many coals have moisture less than 15% (see figure 2-11).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have practiced the Puri method on a coal formation having a moisture content less than 15%, as called for in claim 2039, since moisture is a nuisance in such processes, and since many coal seams have moisture values below 15%.

Puri also teaches the pyrolysis temperature range as called for in claim 2041.

Puri also teaches the electric heater as called for in claim 2042.

Puri also teaches the flameless combustor as called for in claim 2044.

With regards to claim 2049; the Puri reference does not explicitly teach the transferring by conduction; however this is inherent in a solid substance such as coal.

With regards to claim 2050; most coals inherently have thermal conductivities greater than about 0.5 W/(m°C). Furthermore, since applicant has not disclosed any special features of the heating which increase the conductivity; it is apparent that any heating of coal will increase the thermal conductivity.

With regards to claims 2051-2053, 2057-2067; the nature of hydrocarbons produced from such heating is highly variable, and dependent upon many factors, not least of which is the characteristics of the coal. The components of the produced

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mixture are deemed to be the results of design variables, including coal characteristics and temperature.

With regards to claim 2072, the increase in permeability is inherent in the Puri process.

With regards to claim 2073, the increase in permeability is inherent in the Puri process.

With regards to claim 2074; it would have been obvious to one of ordinary skill in the art at the time of the invention to have practiced the Puri process to yield more than 60%; since a greater yield is clearly desirable.

Regarding independent claim 2078:

Puri teaches a method of treating a coal formation comprising the steps of providing heat from one or more heaters located in heater wells (see col. 6, lines 34-44); allowing the heat to transfer; and producing a mixture from the formation. Puri fails to teach the moisture content less than 15%.

Terry teaches that moisture is a nuisance in such processes (col. 1, line 28, and col. 2, line 7); and "Coalbed Methane" teaches that many coals have moisture less than 15% (see figure 2-11).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have practiced the Puri method on a coal formation having a moisture content less than 15%, as called for in claim 2078, since moisture is a nuisance in such processes, and since many coal seams have moisture values below 15%.

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Puri also teaches the pyrolysis temperature range as called for in claim 2080.

Puri also teaches the electric heater as called for in claim 2081.

Puri also teaches the flameless combustor as called for in claim 2083.

With regards to claim 2088; the Puri reference does not explicitly teach the transferring by conduction; however this is inherent in a solid substance such as coal.

With regards to claim 2089; most coals inherently have thermal conductivities greater than about $0.5 \text{ W/(m}^\circ\text{C)}$. Furthermore, since applicant has not disclosed any special features of the heating which increase the conductivity; it is apparent that any heating of coal will increase the thermal conductivity.

With regards to claims and 2090-2092, 2096-2106; the nature of hydrocarbons produced from such heating is highly variable, and dependent upon many factors, not least of which is the characteristics of the coal. The components of the produced mixture are deemed to be the results of design variables, including coal characteristics and temperature.

With regards to claim 2111, the increase in permeability is inherent in the Puri process.

With regards to claim 2112, the increase in permeability is inherent in the Puri process.

With regards to claim 2113; it would have been obvious to one of ordinary skill in the art at the time of the invention to have practiced the Puri process to yield more than 60%; since a greater yield is clearly desirable.

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Regarding independent claim 5150:

Puri teaches a method of treating a coal formation comprising the steps of providing heat from one or more heaters located in heater wells (see col. 6, lines 34-44); allowing the heat to transfer; and producing a mixture from the formation. Puri fails to teach the formation has been evaluating a moisture content, wherein the moisture content is less than 20%.

Terry teaches that moisture is a nuisance in such processes (col. 1, line 28, and col. 2, line 7); and "Coalbed Methane" teaches that many coals have moisture less than 15% (see figure 2-11).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have practiced the Puri method on a coal formation having a moisture content less than 20%, and to have included the step of evaluating the moisture as called for in claim 5150, since moisture is a nuisance in such processes, and since many coal seams have moisture values below 20%.

With regards to claim 5152; it would have been obvious to one of ordinary skill in the art at the time of the invention to have practiced the Puri method on a coal formation having a moisture less than 15%, since moisture is a nuisance, and since most coals have moisture less than 15%.

With regards to claim 5153; it would have been obvious to one of ordinary skill in the art at the time of the invention to have practiced the Puri method on a coal formation having a moisture less than 10%, since moisture is a nuisance, and since most coals have moisture less than 10%.

5. Claims 2068 and 2107 are rejected under 35 U.S.C. 103(a) as being unpatentable over Puri; Terry, and Coalbed Methane and further in view of Gregoli, et al. (U.S. Patent number 6,016,867).

The Puri reference fails to teach the altering pressure to inhibit production of hydrocarbons having carbon numbers greater than about 25. The Gregoli reference teaches that in a similar in-situ processes, it is beneficial to use high pressure to break heavy hydrocarbons. It is well known that carbons having carbon numbers greater than about 25 are considered to be heavy; and impede production because they are dense and viscous. It would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the Puri method to have included altering pressure to inhibit production of hydrocarbons having carbon numbers greater than about 25, as called for in claims 2068 and 2107, in order to improve production.

1. Claims 2046, 2085, 5151 are rejected under 35 U.S.C. 103(a) as being unpatentable over Puri; Terry, and Coalbed Methane and further in view of Elkins (U.S. Patent number 2,734,579).

The Puri reference fails to teach the controlling the temperature and pressure wherein the temperature is controlled as a function of the pressure or the pressure is controlled as a function of the temperature.

Elkins teaches controlling the pressure in order to lower the temperature (col. 3, line 46); this is done in order to help prevent overheating. It would have been obvious to

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one of ordinary skill in the art at the time of the invention to have modified the Puri process to have included the temperature is controlled as a function of the pressure or the pressure is controlled as a function of the temperature as called for in claims 2046, 2085, and 5151 as taught by Elkins, in order to prevent overheating.

2. Claim 5155 is rejected under 35 U.S.C. 103(a) as being unpatentable over Puri; Terry, and Coalbed Methane and further in view of Kasevich, et al. (U.S. Patent number 4,457,365).

The Puri reference fails to teach the heating rate. It is known to heat at rates of less than 10°C per day, as shown by Kasevich (figure 3). It is apparent that this low heating rate is desirable because it results in more uniform heating, and reduces the possibility of hot spots. It would have been obvious to one of ordinary skill in the art at the time of the invention to have further modified the Puri method to have included heating at a rate of less than about 10°C per day as called for in claim 5155, in order to achieve more uniform heating. The claim limitations drawn to the heating energy are nothing more than well known thermodynamic equations.

3. Claim 2075, 2076, 2114, 2115, and 5154 are rejected under 35 U.S.C. 103(a) as being unpatentable over Puri; Terry, and Coalbed Methane and further in view of Van Meurs, et al. (U.S. Patent number 4,886,118).

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The Puri reference fails to teach the at least about 7 heaters for each production well. Note that Puri teaches that the number of wells is a matter of engineering design (col. 4, lines 1-3).

The Van Meurs reference teaches a similar in situ heating system, and further teaches that six or twelve heat sources for each production well significantly increases the production (col. 8, line 24).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the Puri method to have included at least about 7 heat sources disposed in the formation for each production well, as called for in claims 2075, 2114, and 5154, in order to improve production.

With regards to claim 2076 and 2115; the Van Meurs reference teaches the heat sources surrounding the production well; since this includes at least 3 sources this inherently includes a triangle. It would have been further obvious to one of ordinary skill in the art at the time of the invention to have further modified the Puri method to have included at least 3 sources in a triangle as called for in claim 2076 and 2115, in order to increase production.

4. Claims 2077 and 2116 are rejected under 35 U.S.C. 103(a) as being unpatentable over Puri; Terry, Coalbed Methane, Van Meurs and further in view of Salomonsson (U.S. Patent number 2,914,309).

The Van Meurs and Puri references fail to explicitly teach the unit of heat sources in a triangular pattern and the plurality of units in a repetitive pattern. It is noted that the

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Van Meurs reference teaches the heat sources surrounding the production well, which would inherently include a triangular pattern.

Salomonsson teaches that it is desirable to have a repetitive pattern in order to cover the area evenly. It is apparent that this is beneficial in order to prevent hot spots.

It would have been further obvious to one of ordinary skill in the art at the time of the invention to have further modified the Puri method to have included a unit of a triangular pattern and a repetitive pattern of units as called for in claims 2077 and 2116; in order to cover the area evenly.

5. Claims 2044 and 2084 are rejected under 35 U.S.C. 103(a) as being unpatentable over Puri, Terry, and Coalbed Methane as applied to claims 2039 and 2078 above, and further in view of Terry (U.S. Patent number 3,952,802).

Puri fails to teach the natural distributed combustor.

Terry teaches a natural distributed combustor for similar processes, and teaches that it is advantageous for high sulfur coal.

It would have been further obvious to one of ordinary skill in the art at the time of the invention to have practiced the Puri method with a natural distributed combustor as called for in claims 2044 and 2084, in order to process high sulfur coal.

Double Patenting

6. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11

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F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

7. Claims 2040, 2047, 2048, 2054-2056, 2069-2071, 2064, 2079, 2086, 2087, 2093-2095, 2108-2110, and 2104 have been identified as including subject matter which is allowable over the prior art.

8. Claims 2039-2042, 2044-2081, 2083-2116, and 5150-5155 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over copending Application Nos. 09/840,937; 09/841,170; 09/841,288; 09/841,291; 09/841,300; 09/841,432; 09/841,438; 09/841,445; 09/841,495; 09/841,638; and 09/841,639; in view of Terry (U.S. Patent number 3,924,680) and "Coalbed Methane: Principles and Practice". Although the conflicting claims are not identical, they are not patentably distinct from each other because the differences are obvious. Each of these copending applications has an independent claim which generally corresponds to a claim in the instant application. The copending applications do not call for the moisture; however the moisture value is obvious (as set forth in the 103 rejections above). A table listing the applications and the claims in the instant application which correspond is shown below:

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Copending application	Corresponding claims
09/840,937	2069, 2070, 2071, 2108, 2109, 2110
09/841,170	2040, 2079
09/841,288	2069, 2070, 2071, 2108, 2109, 2110
09/841,291	2065,2104
09/841,300	2055, 2094
09/841,432	2065,2104
09/841,438	2056, 2095
09/841,445	2069, 2070, 2071, 2108, 2109, 2110
09/841,495	2056, 2095
09/841,638	2065,2104
09/841,639	2054, 2093

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

9. Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John Kreck whose telephone number is (703)308-2725. The examiner can normally be reached on M-F 6:00 am - 3:00 pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Heather Shackelford can be reached on (703)308-2978. The fax phone numbers for the organization where this application or proceeding is assigned are (703)305-3597 for regular communications and (703)305-7687 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)306-4177.



John Kreck
Examiner
Art Unit 3673

JJK
May 1, 2003